51. An exposure method in which the image of the pattern of a mask is projected onto a substrate on a substrate stage via a projection optical system, the method comprising:

using a first focus position detection system which, by illuminating with a beam for detection, obliquely with respect to an optical axis of the projection optical system, a first set of a plurality of measurement points on a surface for detection, on an object plane side or on an image plane side of the projection optical system, individually detects focus positions which are positioned in the optical axis direction at the plurality of measurement points; and a second focus position detection system which, by illuminating with a beam for detection, obliquely with respect to the optical axis, a second set of a plurality of measurement points on the surface for detection, individually detects the focus positions at the plurality of measurement points; the first set of a plurality of measurement points and the second set of a plurality of measurement points having at least some measurement points substantially in common;

detecting focus positions at the common measurement points using the first and second focus position detection systems;

performing calibration of detection results of the first

and second focus position detection systems based on the detection results; and,

focusing the image plane of the projection optical system on the surface of the substrate by using the detection results of at least one of the first and second focus position detection systems.

52. The exposure method according to claim 51, characterized in that the first and second focus position detection systems illuminate the vicinity of the common measurement points with beams for detection that vibrate in mutually different directions, and the reflected light of the beam for detection is detected.

53. The exposure method according to claim 51, wherein the method further uses a third focus position detection system which detects the focus state of the mask and the substrate, by detecting, via the projection optical system, at least one of a first mark on the mask and a second mark on the substrate stage;

when detecting the focus positions at the common measurement points using the first and second focus position detection systems, if a difference in the detection results reaches a prescribed state, the focus state between the mask and the substrate is detected by the third focus position detection system; and,

based on the detection results, calibration of the

detection results of the first and second focus position detection systems is performed.

54. An exposure apparatus, having a projection optical system which projects an image of the pattern of a mask onto a substrate and a substrate stage which positions the substrate within a plane substantially perpendicular to the optical axis of the projection optical system, the apparatus further comprising:

a focusing stage, which drives at least either the mask and the substrate in the direction of the optical axis of the projection optical system;

a first focus position detection system which, by illuminating with a beam for detection, obliquely with respect to the optical axis of the projection optical system, a first set of a plurality of measurement points on a surface for detection on an object plane side or on an image plane side of the projection optical system, individually detects focus positions which are positioned in the optical axis direction at the plurality of measurement points; and

a second focus position detection system which, by illuminating with a beam for detection, obliquely with respect to the optical axis, a second set of a plurality of measurement points on the surface for detection, at least some of which are substantially in common with the first set of plurality of measurement points, individually detects the focus positions at

the plurality of measurement points;

wherein the focusing stage is driven, based on detection results of at least one of the first and second focus position detection systems, to focus the image plane of the projection optical system on the surface of the substrate.

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55. The exposure apparatus according to claim 54, further comprising:

a third focus position detection system which detects a focus state of the mask and the substrate, by detecting at least one of a first mark on the mask and a second mark on the substrate stage via the projection optical system; and

a control system which, based on the detection results of the third focus position detection system, performs calibration of the detection results of the first and second focus position detection systems.

56. The exposure apparatus according to claim 55, wherein the first and second focus position detection systems comprise:

light-transmission systems to illuminate the vicinity of the common measurement points with beams for detection which vibrate in mutually different directions;

light-receiving systems which receive reflected light of the beams for detection; and

detection systems which synchronously detect the detection signals from the light-receiving systems, in sync with the vibration of the beams for detection.

57. An exposure method, using an exposure light source which generates an exposure beam and an exposure main unit which holds a mask and a substrate, and in which the exposure beam is used to transfer a pattern of the mask onto the substrate, wherein

a first illumination system which transmits the exposure beam from the exposure light source is supported independently of the exposure main unit;

a second illumination system which guides the exposure beam from the first illumination system to the exposure main unit is fixed to the exposure main unit; and,

the optical paths of the exposure beam within the first illumination system and within the second illumination system are each substantially sealed.

58. The exposure method according to claim 57, wherein:

gas which is transmissive with respect to the exposure beam is independently supplied to the optical paths which are each substantially sealed; and

temperature-controlled gas is supplied to the vicinity of the mask, substantially in parallel with a pattern formation face of the mask.

59. An exposure apparatus, having an exposure light source which generates an exposure beam and an exposure main unit which holds a mask and substrate, and in which the exposure beam is used to transfer a pattern of the mask onto the substrate, the exposure apparatus comprising:

a first illumination system, supported independently from the exposure main unit, which transmits the exposure beam from the exposure light source; and

a second illumination system, fixed to the exposure main unit, which guides the exposure beam emitted from the first illumination system to the exposure main unit.

60. The exposure apparatus according to claim 59, wherein the optical paths of the exposure beam within the first illumination system and the second illumination system are each substantially sealed, and gas transmissive with respect to the exposure beam is independently supplied to the sealed first and second optical paths.

61. The exposure apparatus according to claim 59 wherein a plane of incidence of the exposure beam emitted from the first illumination system on the second illumination system is conjugate with respect to the pattern formation face of the mask, and that a field stop is positioned in the incidence plane.

62. An exposure apparatus, having a projection optical system which projects an image of a pattern of a mask onto a substrate, and a substrate stage which holds the substrate and positions the substrate in both first and second directions, which intersect each other; the exposure apparatus comprising:

a first interferometer and a second interferometer, which respectively detect the positions in the first and second directions of the substrate stage; and,

a temperature-control device, having first, second, and third blower outlets to supply temperature-controlled gas to an optical path of the measurement beam of the first interferometer, to an optical path of the measurement beam of the second interferometer, and onto the substrate, respectively.

63. The exposure apparatus according to claim 62, wherein:

the first interferometer and the second interferometer each have a reference mirror, installed on the projection optical system and irradiated by a reference beam; and,

the third blower outlet of the temperature control device is formed in an extended end part of a cover member to supply temperature-controlled gas to the reference beams.

64. An exposure apparatus for transfer of the image of the pattern of a mask onto a substrate via a projection optical system, the apparatus comprising:

a cylindrical retaining member which covers sides of the projection optical system, and

a temperature control device which supplies temperature-controlled gas from an aperture provided in part of the retaining member, through a space between the sides of the projection optical system and the retaining member, onto the substrate.

65. The exposure apparatus according to claim 64, wherein a coolant to cool the projection optical system is supplied to

the inside of the retaining member.

66. A method for manufacturing an exposure apparatus, comprising the steps of:

providing a projection optical system which projects an image of a pattern of a mask onto a substrate;

providing a substrate stage which positions the substrate within a plane substantially perpendicular to an optical axis of the projection optical system;

providing a focusing stage which drives at least one of the mask and the substrate in a direction of the optical axis of the projection optical system;

providing a first focus position detection system which, by illuminating with a beam for detection, obliquely with respect to the optical axis of the projection optical system, a first set of a plurality of measurement points on a surface for detection on an object plane side and on an image plane side of the projection optical system, individually detects focus positions which are positioned in the optical axis direction of the plurality of measurement points; and,

providing a second focus position detection system which, by illuminating with a beam for detection, obliquely with respect to the optical axis, a second set of a plurality of measurement points on the surface for detection, at least some of which are substantially common with the first set of plurality of measurement points, individually detects focus positions at the

plurality of measurement points.

67. A method for manufacturing an exposure apparatus, comprising the steps of:

providing an exposure light source which generates an exposure beam;

providing an exposure main unit which holds a mask and substrate;

providing a first illumination system, supported independently from the exposure main unit, which transmits the exposure beam from the exposure light source; and,

providing a second illumination system, fixed to the exposure main unit, which guides the exposure beam emitted from the first illumination system to the exposure main unit.

68. A method for manufacturing an exposure apparatus, comprising the steps of:

providing a projection optical system which projects an image of a pattern of a mask onto a substrate;

providing a substrate stage which holds the substrate, and which positions the substrate in each of first and second directions, which intersect each other;

providing a first interferometer and a second interferometer, which detect the positions in the first and second directions respectively of the substrate stage; and,

providing a temperature control device, having first, second and third blower outlets to supply temperature-controlled

gas to an optical path of a measurement beam of the first interferometer, an optical path of a measurement beam of the second interferometer, and onto the substrate, respectively.

69. A method for manufacturing an exposure apparatus to transfer the image of the pattern of a mask onto a substrate via a projection optical system, the method comprising the steps of:

providing a cylindrical retaining member covering sides of the projection optical system, and

providing a temperature control device which supplies, from an aperture provided in part of the retaining member, temperature-controlled gas which passes through a space between the sides of the projection optical system and the retaining member onto the substrate.

70. A device manufacture method comprising a process for transfer of the pattern of the mask onto the substrate using the exposure method according to claim 57.

71. An exposure method in which a mask is illuminated by an exposure beam, and a substrate is exposed to the exposure beam via a projection optical system, the method comprising:

illuminating, with a first beam, a plurality of measurement points on a surface for detection on at least one of an object plane side and an image plane side of the projection optical system;

illuminating, with a second beam, measurement points, at least one of which is set at substantially the same position as

at least one of the plurality of measurement points; and

detecting position information for the substrate in a prescribed direction along the optical axis of the projection optical system at the at least one of the measurement points by using the first and second beams.

72. An exposure apparatus, in which a mask is illuminated by an exposure beam, and a substrate is exposed to the exposure beam via a projection optical system, the apparatus comprising a position detection system in which a first beam illuminates a plurality of measurement points on a surface for detection on at least one of an object plane side and an image plane side of the projection optical system, while a second beam illuminates measurement points, at least one of which is set in substantially the same position as the plurality of measurement points on the surface for detection, and the first and second beams are used to detect position information for the substrate in a prescribed direction along an optical axis of the projection optical system at the at least one of the measurement points.

73. The exposure apparatus according to claim 72, wherein the position detection system irradiates the first and second beams obliquely with respect to the optical axis of the projection optical system and with respect to the surface for detection, and from mutually different directions.

74. The exposure apparatus according to claim 72, wherein the position detection system sets some or all of the at least

one of the measurement points within a prescribed area on the surface for detection, illuminated by the illumination light.

75. The exposure apparatus according to claim 72, wherein the position detection system illuminates, with the second beam, a plurality of measurement points which include the at least one of the measurement points; and the exposure apparatus further comprising an adjustment device which, based on the position information for the substrate detected using the illumination of at least one of the first and second beams, moves the image plane of the projection optical system relative to the substrate.

76. A device manufacture method comprising a process to transfer the pattern of a mask onto a substrate by using the exposure apparatus claim 59.

77. The exposure apparatus according to claim 59, wherein the first illumination system comprises an optical member having a driving mechanism.

78. The exposure apparatus according to claim 77, wherein the second illumination system comprises an optical member not having a driving mechanism.

79. The exposure apparatus according to claim 77, wherein the purpose of the driving mechanism is provided to enable variation of the illumination shape or the illumination intensity of the exposure beam illuminating the mask.

80. The exposure apparatus according to claim 77, wherein the optical member having the driving mechanism includes a

movable blind enabling changes to the illumination range of the mask by the exposure beam.

81. The exposure apparatus according to claim 80, wherein a fixed blind to fix the illumination range of the mask by the exposure beam is provided in the first illumination system.

82. The exposure apparatus according to claim 77, wherein the optical member having a driving mechanism includes an attenuator which attenuates the exposure beam.

83. The exposure apparatus according to claim 59, wherein

the exposure main unit has a first support member to support the projection system which projects an image of an pattern of the mask onto the substrate, and

the second illumination system is fixed to the first support member, and the first illumination system is supported by a second support member independent of the first support member.

84. The exposure apparatus according to claim 83, wherein the exposure light source is positioned independently of the first support member and of the second support member.

85. The exposure apparatus according to claim 83, wherein the first support member and the second support member are each positioned on the same base, and the exposure light source is positioned independently of the base.

86. The exposure method according to claim 67, wherein the first illumination system comprises an optical member having

a driving mechanism which is source of vibrations, and that the second illumination system comprises an optical member not having a driving mechanism which is a source of vibrations.

87. An exposure apparatus, having an exposure light source which generates an exposure beam and a first support member which supports a projection system which projects an image of a pattern of a mask onto a substrate, and in which the exposure beam is used to transfer the pattern of the mask onto the substrate;

the exposure apparatus comprising:

an illumination system which guides the exposure beam from the exposure light source to the mask and which has an optical member having a driving mechanism; and

a second support member which supports the optical member of the illumination system, independently of the first support member so as not to become a source of vibrations for the first support member.

88. The exposure apparatus according to claim 87, wherein

the illumination system has a first illumination system which includes the optical member having the driving mechanism and a second illumination system which does not include any optical members having driving mechanisms, and

the second illumination system is fixed to the first support member.

89. The exposure apparatus according to claim 87, wherein the driving mechanism is provided to enable variation of one of

an illumination shape and an illumination intensity of the exposure beam illuminating the mask.

90. The exposure apparatus according to claim 87, wherein the first support member and the second support member are positioned on the same base.

91. The exposure apparatus according to claim 87 wherein the exposure light source is positioned independently of the first support member and of the second support member.

92. An exposure apparatus which transfers the pattern of a mask onto a substrate, using an exposure beam generated by an exposure light source, the apparatus comprising:

an illumination system which guides the exposure beam from the exposure light source to the mask; and

a first illumination unit, provided within the illumination system, holding a plurality of optical members driven by a driving unit, and in which an optical path of the exposure beam, including the plurality of optical members, is substantially sealed.

93. The exposure apparatus according to claim 92, further comprising a supply device which supplies gas, transmissive with respect to the exposure beam, to the sealed optical path.

94. The exposure apparatus according to claim 92, further comprising a second illumination system unit which guides the exposure beam from the first illumination system unit to the mask, and a first support member which supports the projection system

which projects the image of the pattern of the mask onto the substrate; and wherein

the first illumination system unit is supported by a second support member independent from the first support member, and the second illumination system unit is fixed to the first support member.

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95. The exposure apparatus according to claim 94, wherein the first support member and the second support member are positioned on the same base.

96. The exposure apparatus according to claim 94 wherein the exposure light source is positioned independently of the first support member and the second support member.

97. An exposure method in which an image of a pattern of a mask is transferred onto a substrate via a projection optical system supported by a first supporting member, using the exposure beam which is generated from an exposure light source, the exposure method comprising the steps of:

guiding the exposure beam from the exposure light source to the mask via an illumination system which has an optical element having a driving mechanism which is a source of vibrations;

supporting the optical element of the illumination system independently from the first support member; and

driving the driving mechanisms without transmitting the vibrations to the first support member.

98. The exposure method according to claim 97, wherein

the driving mechanism is provided to drive the optical member to change the illumination conditions of the mask by the exposure beam.

99. The exposure method according to claim 87 wherein an optical path within the illumination system containing the optical member having the driving mechanism which is a source of vibration is substantially sealed, and a gas which is transmissive with respect to the exposure beam is supplied to the illumination system.

100. A device manufacturing method comprising a process in which the pattern of a mask is transferred to a substrate, using the exposure apparatus of claim 87.